

Reactome: A curated knowledgebase of biomolecular pathways

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Reactome (<http://www.reactome.org>) is a free, open-source, curated and peer-reviewed knowledgebase of biomolecular pathways. Its aim is to provide intuitive bioinformatics tools for visualisation, interpretation and analysis of pathway knowledge to support basic research, genome analysis, modeling, systems biology and education.

Pathways are built from connected “reactions” that encompass many types of biochemical events. Reactions are derived from literature and must cite a publication that experimentally validates them. Pathways are authored by expert biologists and peer reviewed before incorporation into the database. 9,584 reactions in Reactome cover 9,238 human gene products (12,527 including IntAct interactors), supported by 22,838 literature references.

Users can search for proteins or compounds and see details of the complexes, reactions and pathways they participate in. Pathway diagrams allow users to examine the molecular events that constitute the steps in pathways and to view details of the proteins, complexes and compounds involved.

Different forms of pathways analysis can be performed with the Reactome analysis tools. Users can submit a list of identifiers for overrepresentation analysis or submit quantitative datasets, such as microarray data, for expression analysis. Results of these analyses are overlaid onto the Pathways Overview and Diagram Viewer for easy navigation and interpretation.

Interaction data from multiple resources can be used to expand pathways. Interactors from IntAct are included by default in the search feature and can be taken into account in the analysis service. Finally, pathways or all Reactome content can be downloaded in many formats including TSV, CSV, PDF, SBML, BioPax and PSI-MITAB.